# Deformable Sensors based on Architectured 2D Materials

We have demonstrated a stretchable photosensor based on crumpled graphene which exhibits enhanced and strain-tunable photoresponsivity (*Advanced Materials* **28**, 4639 (2016); *Nanoscale* **9**, 4058 (2017); *Advanced Functional Materials* **33**, 1902216 (2019)). Crumple density, height, and pitch are modulated using applied strain and the crumpling is fully reversible during cyclical stretching and release, introducing a new capability of strain-tunable photoabsorption enhancement (**Figure 5**). Our work demonstrates a robust approach for stretchable and deformable graphene photodetector devices and showcases advanced functionalities where photosensitivity is modulated by mechanical deformation. We are also exploring controlled incision/cutting (i.e., kirigami) inspired wearable sweat sensors (**Figure 5**) based on graphene devices (*Materials Today* **34**, 58 (2020)).

